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CONTENTS:

Some Species and Varieties of Elymus. <i>K. M. Wiegand</i>	81
Rosa blanda and its Allies. <i>M. L. Fernald</i>	90
Some Connecticut Plants. <i>R. W. Woodward</i>	97
Proper Name for the Sassafras. <i>S. F. Blake</i>	98
A new botanical Textbook (notice). <i>C. H. Knowlton</i>	100

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JOURNAL OF

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SOME SPECIES AND VARIETIES OF ELYMUS IN EASTERN NORTH AMERICA.

K. M. WIEGAND.

THE genus *Elymus* has long been a problem to students of grasses. The older treatments were wholly inadequate, since several of the common species were formerly unrecognized. During recent years Scribner and others have described several additional species from eastern North America, but no comprehensive treatment of the genus was given by these writers. In 1908 Hitchcock contributed the article on *Elymus* to the seventh edition of Gray's Manual, but this treatment seems not to have cleared the situation to any appreciable extent; and the same statement may be made in reference to the treatment of the genus by Nash in the second edition of Britton and Brown's Illustrated Flora in 1913. During the course of studies upon the plants of central New York, the writer became interested in *Elymus*. The present article is the result of this study. It was begun in the herbarium of the College of Agriculture at Cornell University; but later, through the courtesy of those in charge of the Gray Herbarium, the work was continued and completed at that institution. The revision is herewith presented with the hope that it may contribute toward a clearer understanding of the genus.

In many instances it will be noted that the characters used in the key are not those ordinarily employed to separate species of *Elymus*. To the writer these here used seem more essential, and seem to separate the species more naturally. During the study a very great many measurements were made of all parts of the plant, and a surprising constancy in size, within certain limits was noted in each species and

variety. It was found impracticable to indicate the length of the body of the glume or lemma because of the gradual transition into the awn. In the text all measurements in length of these two organs include the awn. A much better and more definite indication of the size of the floret is found in the palet, the apex of which is easily recognizable. The degree of pubescence of both the florets and the foliage varies widely in nearly every species, yet in some cases it seems to indicate a more or less definite varietal or even specific difference. The breadth, induration and form of the glumes have long been used in distinguishing the species, and in our study also prove of great value. There is, however, much variation of these organs in *E. virginicus* and *E. robustus*.

Much of the previous difficulty in *Elymus* was due to the failure to recognize the species here described as new. This has for years formed a large portion of the material passing as *E. canadensis*. Further confusion has arisen through the failure to differentiate between *E. canadensis* and *E. robustus* along what now seem to be the proper specific lines. The present paper deals only with *E. virginicus*, *E. canadensis* and their immediate allies. These form a rather natural group, from which *E. arenarius*, *E. glaucus*, and other species may be excluded.

SYNOPSIS AND KEY TO THE SPECIES TREATED.

- a. Awns straight (when mature and dry): palet 5.2–8 (rarely 8.5–9.2 in *E. virginicus*) mm. long *b.*
- b.* Glumes broad (0.9–2 mm. wide), strongly indurated and more or less curved at the base *c.*
- c.* Glumes 1–2.7 cm. long: lemmas 1–3 cm. long *d.*
- d.* Glumes and lemmas more or less awned *e.*
- e.* Lemmas and glumes glabrous or merely scabrous on the margins *f.*
 - f.* Leaves flat: spikes usually included at the base... *E. virginicus.*
 - f.* Leaves involute when dry, narrower: spikes mostly exserted: plant lower... *E. virgin.*, var. *halophilus*.
 - e.* Lemmas and glumes villous-hirsute... *E. virgin.*, var. *hirsutiglumis*.
- d.* Glumes and lemmas awnless or nearly so *E. virgin.*, var. *submuticus*.
- c.* Glumes 2.7–4 cm. long: lemmas (2.8–) 3.5–4.5 cm. long: spikes exserted *g.*
 - g.* Glumes and lemmas villous-hirsute..... *E. australis.*
 - g.* Glumes and lemmas strigose-scabrous or glabrous. *E. aust.*, var. *glabriflorus*.
- b.* Glumes narrow, often setiform (0.4–0.8 mm. wide), indurated and terete below, essentially straight *h.*
- h.* Palet 7.5–8 mm. long: rachis-joints 3–4.5 (rarely 5–8) mm. long: spikelets 2–4-flowered: leaves and sheaths glabrous..... *E. riparius*.

- h. Palet 5.2–6.7 mm. long: rachis-joints 1.5–3 mm. long: spikelets 1(rarely 2)-flowered: foliage villous i.
 - i. Lemmas and glumes villous-hirsute..... *E. striatus*.
 - i. Lemmas and glumes glabrous or slightly strigose *E. stri.*, var. *arkansanus*.
- a. Awns curved outward toward apex (when mature and dry): palet 9–11(–15) mm. long (occasionally 8 mm. in *E. diversiglumis*) j.
 - j. Leaves rather thin, usually somewhat villous above: spike slender and rather loose: glumes 2–25(–35) mm. long k.
 - k. Glumes 2–15 mm. long, setiform: spikelets 2–3-flowered: leaves 6–12 mm. wide: lemmas villous-hirsute..... *E. diversiglumis*.
 - k. Glumes 15–20 (rarely 8–27) mm. long, rather narrow but not setiform, flat above: spikelets 4–7-flowered: leaves 13–20 mm. wide..... *E. canadensis*.
 - j. Leaves firm, 5–15 mm. wide, tending to be involute when dry, usually glabrous: spike somewhat denser: spikelets 2–5(usually 3–4)-flowered: glumes 20–25 (rarely 15–35) mm. long, usually broader and flatter l.
 - l. Lemmas glabrous or sparsely hispidulous..... *E. robustus*.
 - l. Lemmas villous-hirsute..... *E. robust.*, var. *vestitus*.

E. VIRGINICUS L. Sp. Pl. 84 (1753). *E. carolinianus* Walter, Fl. Carolin. 82 (1788). *E. nitidus* Vasey, probably, Bull. Torr. Bot. Club, xiii. 120 (1886). *E. virginicus*, var. *minor* Vasey, small form, Contr. U. S. Nat. Herb. ii. 550 (1891). *E. virginicus*, forma *jejuna* Ramaley, small form, Bull. Geol. and Nat. Hist. Survey Minn. ix. 114 (1894). *E. jejuna* Rydberg, Bull. Torr. Bot. Club, xxxvi. 539 (1909).—Leaves rather narrow, 1.2 cm. wide or less, thin, glabrous or somewhat villous above, green or slightly glaucous; upper sheaths much inflated: spikes rather narrow, straight, included at base or short-exserted; rachis-joints about 5 mm. long: spikelets 2–4-flowered, appressed or somewhat spreading: glumes broad (1.5–2 mm.) and very short-awned (1.4–2.7 cm. long), strongly indurated and curved at the yellowish and usually unstriated subterete base: lemmas 1.8–3 cm. long, glabrous; awn short and straight: palet 6.5–8 (rarely 8.5–9.2) mm. long: grain 5–6 mm. long.—Alluvial bottomlands and stream-banks: Newfoundland and Quebec to District of Columbia, westward to Montana and Colorado, and southward in the central states to Louisiana and Texas.

Var. *halophilus* (Bicknell), n. comb. *E. halophilus* Bicknell, Bull. Torr. Bot. Club, xxxv, 201 (1908).—Differs from the typical form in the lower stature, narrower and involute leaves which are often more glaucous, narrower upper sheaths, and more uniformly exserted short spikes (glumes 12–17 mm. long; lemmas 1.2–22 mm. long; palet 6–8 mm. long).—Brackish marshes and sand along the coast: Washington County, Maine, to Long Island.

Var. *HIRSUTIGLUMIS* (Scribner) Hitchcock, RHODORA, x. 65 (1908). *E. hirsutiglumis* Scribn. Bull. Div. Agrost. 11, p. 58 (1898). *E. intermedius* Scribner & J. G. Smith, Bull. Div. Agrost. 4, p. 38 (1891).—Differs from the typical form in the villous-hirsute lemmas and

glumes.—Coast of Maine to Pennsylvania and westward to Nebraska and Missouri.

Var. *SUBMUTICUS* Hooker, Flor. Bor.-Am. ii. 255 (1840). ?*E. curvatus* Piper, Bull. Torr. Bot. Club, xxx. 233 (1903).—Differs from the typical form in the almost complete absence of awns on both glumes and lemmas.—Dartmouth River, Gaspé County, Quebec, and the coast of Massachusetts, and from Illinois to Saskatchewan, Nebraska, Kansas and Oklahoma, also in Washington (*Piper*).

Specimens of *E. virginicus* from central Maine (Penobscot Valley) have unusually large and coarse spikes and large spikelets with the palet 8.5–9.2 mm. long. *E. halophilus* is here maintained as a variety as it differs from the typical form only in minor and variable characters. Many specimens along the coast are transitional in width of leaf, degree of involution, and length of spike.

E. AUSTRALIS Scribner & Ball, Bull. Div. Agrost. 24, p. 46 (1901).—Leaves 12 mm. wide or less, thin, sparingly villous above, rarely glabrous, green or slightly glaucous; upper sheaths scarcely inflated: spikes more or less exserted, straight, 8–14 cm. long; joints of the rachis 3–6 mm. long: spikelets usually slightly spreading, 2–4-flowered: glumes elongated, of medium breadth (2.7–4 cm. long, 0.9–1.1 mm. wide), thick and indurated toward the curved, usually unstriated, yellowish base, villous-hirsute: lemmas 3.5–4.5 cm. long, villous-hirsute; awn long and straight: palet 7–8 mm. long: grain 5 mm. long.—Swampy woods and stream-banks, rarely in drier situations, along the coast from eastern Massachusetts to Georgia; and also in Missouri and Nebraska. The Missouri labels seem to indicate drier situations.

Var. *glabriflorus* (Vasey), n. comb. *E. canadensis*, var. *glabriflorus* Vasey, Contr. U. S. Nat. Herb. ii. 550 (1894). *E. glabriflorus* Scribner & Ball, Bull. Div. Agrost. 24, p. 49 (1901).—Differs from the typical form in the glabrous or merely strigose-scabrous glumes and lemmas; the former slightly broader (1.1–1.8 mm. wide). Dry banks and woods: Ayer, Massachusetts (*Manning*); and from Maryland to Florida, westward through Tennessee and Illinois to Nebraska and Texas.

E. australis is a near relative of *E. virginicus* from which it differs only in the longer awns, more regularly exserted spikes and more generally villous leaves. The differences are, however, sufficiently constant and obvious to warrant its retention as a valid species.

E. riparius, sp. nov., procerus; foliis 7–25 mm. latis tenuibus viridibus vel leviter glaucescentibus glabris, vaginis strictis glabris; spicis multum exsertis parum nutantibus 7–20 cm. longis (aristis exceptis); spiculis 2–4-floris subpatentibus, segmentis racheos 3–4.5 raro 5–8 mm. longis, glumis scabris angustissimis (0.4–0.8 mm. latis, 1.8–3 cm. longis) basi tereti indurata flavescente non striata recta,

(true *E. canadensis* L. like Form.
Ann.-Mall. - Nat. 103 312, 1926.)

lemmatibus (2.2-)3-4.5 cm. longis subtiliter et tenuiter hispidulosis, aristis magnis rectis, palea 7.5-8 mm. longa, caryopsibus 5-6 mm. longis.

Plant tall: leaves 7-25 mm. broad, thin, green or slightly glaucous, glabrous; sheaths close, smooth: spikes much exserted, slightly nodding, 7-20 cm. long, exclusive of the awns: spikelets 2-4-flowered, somewhat spreading; joints of the rachis 3-4.5 rarely 5-8 mm. long: glumes very slender (0.4-0.8 mm. wide, 1.8-3 cm. long), terete, and indurated toward the nonstriae, yellowish, straight base; lemmas (2.2-)3-4.5 cm. long, minutely and sparsely hispidulous; awns long and straight: palet 7.5-8 mm. long: grain 5-6 mm. long.—Along stream-margins and in alluvial bottomlands: central Maine, through New Hampshire and Vermont to western Massachusetts, northern Connecticut, westward to western New York, and southward to the mountains of Virginia, West Virginia and Kentucky. The Rhode Island and the Delaware specimens listed below seem out of the normal range. MAINE: Franklin County: river-bank, Farmington, *C. H. Knowlton*. Kennebec County: alluvial river-thickets, Sidney, August 18, 1916, *Fernald & Long*, no. 12747; dry open clay river-terraces, Sidney, August 18, 1916, *Fernald & Long*, no. 12746. Oxford County: Buckfield, 1895, *J. C. Parlin*. NEW HAMPSHIRE: Carroll County: banks of Saco River, North Conway, August 30, 1855, *Wm. Boott*. Grafton County: railroad yards, Woodsville, August 8, 1908, *E. F. Williams*. Cheshire County: alluvial thickets, Alstead, August 2, 1900, *Fernald*, no. 373. VERMONT: Orleans County; Willoughby Garden, Willoughby, August 1, 1894, *E. F. Williams*; North Slide, Willoughby Mountain, August 15, 1896, *E. & C. E. Faxon*. Caledonia County: St. Johnsbury Center, August 17, 1874, *J. W. Congdon*. Addison County: White River Valley, Hancock, July 18, 1908, *E. F. Williams*. Windham County: shore of West River, Townsend, August 26, 1911, August 7, 1913, *L. A. Wheeler*, no. 15; riverbanks, Brattleboro, August 2, 1898, *B. L. Robinson*, no. 85. MASSACHUSETTS: Essex County: Merrimac River banks near the "Deer leap," Andover, September 19, 1903, *A. S. Pease*. Franklin County: banks of North River, Griswoldville, Coleraine, August 4, 1909, *E. F. Williams*; wet roadside, Conway, August 6, 1909, *E. F. Williams*. Hampshire County: Huntington, August 17, 1912, *B. L. Robinson*, no. 755. Hampden County: Westfield, August 12, 1901, *M. A. Day*, no. 55. Berkshire County: Williamstown, July 28, 1898, *J. R. Churchill*; Stockbridge, August 23, 1902, *R. Hoffmann*; Pittsfield, September 23, 1899, *R. Hoffmann*. RHODE ISLAND: Providence County: border of Pawtuxet River, Cranston, August 4, 1911, *Thos. Hope*. CONNECTICUT: Hartford County: East Granby, August 4, 1901, *A. W. Driggs*; river-banks, Southington, August 17, 1895, *C. H. Bissell*, no. 753. Litchfield County: alluvium of the Housatonic, Canaan, September 6, 1909, *Fernald*. NEW YORK: St. Lawrence County; roadside, Pitcairn, August 1, 1914, *O. P. Phelps*, no. 132.

Orange County: August 11, 1889, *G. V. Nash*. Tompkins County: in dry woods, Six Mile Creek, Ithaca, July 29, 1913, *E. L. Palmer*, no. 167; near Beech Woods, Six Mile Creek, July 29, 1914, *F. P. Metcalf*, no. 1744; damp thickets, Violet Island, Cascadilla Creek, Ithaca, August 18, 1913, *E. L. Palmer*, no. 168; dry woods along lower state road, Cayuga Heights, Ithaca, July 18, 1916, *F. P. Metcalf*, no. 5874; damp alluvial thickets, Fall Creek, Forest Home, Ithaca, August, 1916, *F. P. Metcalf*, nos. 5868, 5869; bottomland woods and thickets in alluvial soil at head of Cayuga Lake, Ithaca, August, 1915, *A. J. Eames*, no. 3566, and *Eames & MacDaniels*, no. 3567 (TYPE in Gray Herb.), August, 1916, *F. P. Metcalf*, nos. 5866, 5867, 5870. DELAWARE: New Castle County: Wilmington, *E. Tatnall*. VIRGINIA: Page County: Stony Man Mountain and vicinity, near Luray, alt. 3800 ft., August 28, 1901, *E. S. & Mrs. Steele*, no. 189. Smyth County: Middle fork of Holston River, Marion, alt. 2100 ft., August 6, 1892, *J. K. Small*. WEST VIRGINIA: Monroe County: Sweet Springs, alt. 550 ft., *E. S. & Mrs. Steele*, no. 218. Pocohontas County: gravelly soil by East fork of the Greenbrier River, near village of Travellers Repose, September 19, 1904, *A. H. Moore*, no. 2345; same, *J. M. Greenman*, no. 89. Tucker County: banks of Blackwater River near Hendricks, September 10, 1904, *J. M. Greenman*, no. 56. KENTUCKY: Harlan County: Big Black Mountain, August, 1893, *T. H. Kearney Jr.*, no. 236.

This plant in aspect resembles *E. canadensis*, *E. striatus* and *E. australis*. In the herbaria it has passed under all three names. Its characters are, however, distinct and constant, and it is really one of the most distinct of the species here treated. It differs from *E. canadensis* and *E. robustus* in the more spreading spikelets, straight awns, longer and more slender glumes, uniformly hispidulous lemmas, and shorter palet. From *E. striatus* it may be recognized by the coarser habit, glabrous foliage, longer rachis-joints, scabrous lemmas, and longer palet. From *E. australis* and its variety *glabriflorus* it is told by the glabrous leaves, slender straight glumes, and usually longer more open spikes. *E. riparius* is very common in central New York.

E. STRIATUS Willd., Sp. Pl. i. 470 (1797). *E. villosus* Muhl. in Willd. Enum. Hort. Berol. 131 (1809). *E. striatus*, var. *villosus* Gray, Manual, ed. 5, 639 (1867). *E. striatus*, var. *Ballii* Pammel, Ia. Geol. Surv. Suppl. Rep. 1903, 347 (1904).—Plant slender: leaves thin, 6–10 mm. wide, green, villous on the upper surface; sheaths close, villous: spikes rather short, 4–9 cm. long exclusive of awns, slightly nodding, long-exserted; rachis-joints very short, 1.5–2.5 (–3) mm. long; spikelets small, 1- rarely 2-flowered, spreading: glumes very narrow, 0.4–0.6 mm. wide, 1.4–3 cm. long, terete and indurated toward the unstriated yellowish base, straight, villous:

lemmas villous, 2.3–5 cm. long; awn long and straight: palet short, 5.2–6.7 mm. long: grain 3 mm. long.—Rocky woodlands and dry thickets: Vermont and eastern Massachusetts to Delaware, and the mountains of North Carolina, westward to Wisconsin, Nebraska, Kansas, and Oklahoma.

Var. ARKANSANA (Scribn. & Ball) Hitchc., RHODORA, viii. 212 (1906). *E. arkansana* Scribner & Ball, Bull. Div. Agrost. 24, p. 45 (1901).—Differs from the typical form in the almost or completely glabrous glumes and lemmas.—Iowa, Missouri, and Arkansas, according to Scribner and Ball. The writer has seen specimens from Nebraska and Virginia (Bedford County, *A. H. Curtis*, July 1871); also doubtful ones from Illinois (Stark County, *V. H. Chase*, no. 45).

E. DIVERSIGLUMIS Scribner & Ball, Bull. Div. Agrost. 24, p. 48 (1901).—Plant of medium height, more or less glaucous: leaves thin, narrower than in the next, 6–12 mm. wide, more or less villous above: spikes much exserted, long, flexuous, nodding and slender (10–20 cm. long); rachis-joints 5–8 mm. long: spikelets mostly appressed, 2- rarely 3-flowered: glumes very short and subulate or acicular, unequal, straight (2–15 mm. long), scabrous or smooth, yellowish and indurated below: lemmas villous-hirsute, 2–4 cm. long; the slender awns much curved when dry; palet 8.5–9 mm. long.—Wisconsin, Minnesota, North Dakota, and Wyoming.

This plant seems to be limited to the northern Great Plains region, and the few specimens at hand would indicate that it is scarce. There is in the Gray Herbarium a specimen which from the label would seem to be a portion of the type material of Buckley's *E. interruptus*. At first glance this is difficult to distinguish from *E. diversiglumis*, but the glumes are somewhat longer and the lemmas are glabrous. It was matched by no other material at hand. *Plat. 35. 1933.*

E. CANADENSIS L., Sp. Pl. 83 (1753). *E. philadelphicus* L. Amoen. Acad. iv. 266 (1759). *E. glaucifolius* Muhl. in Willd. Enum. Hort. Berol. 131 (1809). *E. Canadensis*, var. *glaucifolius* Torr. Fl. U. S. i. 137 (1824).—Plant tall and more or less glaucous: leaves thin and broad, the larger 1.3–2 cm. wide, not involuting, villous above, rarely nearly glabrous: spikes exserted, rather loose and long (10–30 cm. in length), flexuous and nodding; rachis-joints 5–8 mm. long: spikelets slightly spreading, 15–25 mm. long, (3-)4–7-flowered: glumes shorter than in the next (2–27, usually 15–20 mm. long), flat but rather narrow, slightly indurated at base, straight, glabrous, scabrous or hispidulous, tapering to the short awn: lemmas villous-hirsute, rarely almost glabrous, 3.5–4.5 cm. long; awns long and curved when mature and dry: palet 9–15 mm. long: grain 7–8 mm. long.—Alluvial or sandy riverbanks: Gaspé County, Quebec, to the interior of Maine, New Hampshire, Vermont, western Massachusetts, northern Connecti-

E. philadelphicus Turcz. *lvs. Farnell*
Am. Mid. Nat. 10; 313, 1926?
var. *hirsutus* Farn. l.c. 314

cut, and northern and central New York. QUEBEC: Gaspé County: alluvial thickets and woods near mouth of Dartmouth River, August, 1904, *Collins, Fernald, & Pease*. Wright County: Pickanock River, August, 1894, *J. Macoun*, no. 7421. MAINE: Aroostook County: Fort Fairfield, 1881, *K. Furbish*; low gravelly thickets along St. John River, St. Francis, August, 1893, *Fernald*, no. 197, and July, 1900, *E. F. Williams*. Piscataquis County: gravelly shore, Dover, September, 1894, *Fernald*; banks of Pleasant River, Milo, August, 1904, *J. C. Parlin*, no. 1793. Somerset County: sandy river-banks and river-intervales, Dead River, August, 1896, *Fernald & Strong*, no. 490. Oxford County: Rumford, 1889, *J. C. Parlin*; thicket on river-bank, Canton, August, 1906, *J. C. Parlin*, no. 2038. Kennebec County: river thickets, Sydney, August 1916, *Fernald & Long*, no. 12748. NEW HAMPSHIRE: Coos County: Jefferson, August, 1874, *Wm. Boott*; damp roadside near Bois Mountain Station, Jefferson, August, 1907, *A. S. Pease*, no. 10010 $\frac{1}{2}$; alluvial bank of Israel River, Lancaster, August, 1909, *A. S. Pease*, no. 12289; gorge of Diamond River, Dartmouth College Grant, August, 1914, *A. S. Pease*, no. 16282; river-bank, Northumberland, July, 1909, *A. S. Pease*, no. 12127; "Lost Nation," Northumberland, July, 1906, *E. F. Williams*. VERMONT: Caledonia County: St. Johnsbury Center, August, 1874, *J. W. Congdon*. Windham County: moist thickets along West River, Townshend, August 11, 1911, *L. A. Wheeler*. MASSACHUSETTS: Hampden County: sandy river-bank, sericite schist, Russell, May, 1913, *St. John & White*, no. 30; river-thicket, Westfield, September, 1912, *C. H. Knowlton*. Berkshire County: Williamstown, September, 1897, and July, 1898, *J. R. Churchill*; flood plain, Stockbridge, August, 1902, *R. Hoffmann*. CONNECTICUT: Hartford County: bank of river, East Windsor, August, 1902, *C. H. Bissell*. Litchfield County: dry shaded sandy bank of the Naugatuck River, Reynolds Bridge, September 3, 1910, *A. E. Blewitt*. New Haven County: dry sandy woods, banks of Naugatuck River, Waterbury, "very glaucous all over," July, 1908, *A. E. Blewitt*, no. 35; in sandy thicket, Waterbury, September, 1911, *A. E. Blewitt*. NEW YORK: St. Lawrence County: Little River, Canton, August, 1914, *O. P. Phelps*, no. 134. Madison County: Oneida, August, 1906, *H. D. House*, no. 2860.

This species differs from the next in the broad thin villous leaves, longer spikelets with more flowers, shorter glumes and usually in the more slender and open spike. There is some evidence that it matures earlier. *E. canadensis* is a plant of the inland waterways of the Northeast, in situations which are not extremely dry; while *E. robustus* inhabits dry sandy or rocky banks and sand dunes, and has a more southerly and westerly distribution. The striations upon the glumes in both *E. canadensis* and *E. robustus* extend more nearly to the base than in any other species. Specimens of *E. robustus* with

very dense spikes will usually be found to be just in flower. Before maturity the spikes elongate somewhat.

The Linnean type of *E. canadensis* has been discussed by Hitchcock, Contr. U. S. Nat. Herb. xii. 123 (1908). It is there shown that the types of *E. canadensis* and of *E. philadelphicus* were essentially the same, and were a plant with very broad leaves and loose nodding spikes. In his description Linnaeus states that the leaves were very broad, and the spikelets six-flowered. Considering these statements and the fact that the plant came from Canada (*Kalm*) there is little doubt whether this or the next species is the real *E. canadensis*. In the original description of *E. glaucifolius* it also is said to have broad leaves and six-flowered spikelets, and is therefore presumably the same plant, although it came from Pennsylvania from which state we have seen no specimens of *E. canadensis*. However this species is to be expected in the mountains of Pennsylvania. In describing *E. glaucifolius* it was quite possibly contrasted as to glaucescence with *E. riparius* which is scarcely glaucous but which has frequently been mistaken for *E. canadensis*.

E. robustus Scribner & J. G. Smith, Bull. Div. Agrost. 4, p. 37 (1897). *E. brachystachys* Scribn. & Ball, Bull. Div. Agrost. 24, p. 47, (1901).—Plant low or rather tall, more or less glaucous: leaves firm, with a strong involuting tendency, 5–15 mm. wide, usually entirely glabrous: spikes long-exserted, large (8–20, rarely 25 cm. long), usually rather dense and stiff, upright and but slightly nodding; rachis-joints 4–7 mm. long: spikelets slightly spreading or subappressed, 2–5-, mostly 3–4-flowered, 13–17 mm. long: glumes 15–35, mostly 20–25 mm. long, broad or rather narrow (0.5–2 mm. wide), flat and thin above, flattish or slightly indurated at base, glabrous or nearly so, margins seaceous: lemmas glabrous or sparsely hispidulous, 2.8–5 cm. long; the long slender awn somewhat curved and flexuous when mature and dry: palet 9–11 mm. long, rarely in small plants 8.5 mm. long: grain 6–8 mm. long.—Dry sandy, gravelly or rocky soil: southern Grafton County, New Hampshire, to Windham County, Vermont, eastern Massachusetts and Connecticut; also from Illinois and Michigan to Montana, Colorado, Texas, and New Mexico.

The type material of *E. robustus* (Pammel, Iowa), of which a portion from the same distribution is in the Gray Herbarium, has the lemmas entirely glabrous, though the species as originally described included also the var. *vestitus*. The writer has been unable to detect any real difference between *E. brachystachys* Scribn. & Ball and *E. robustus*. Even the alleged difference in length of spike is scarcely apparent.

philadelphicus Trel. var. *brachystachys*
Bentley Trel. var. *brachystachys*

Var. *vestitus*, var. nov., a forma typica differt lemmatibus villosi-hirsutis:

Differs from the typical form in the villous-hirsute lemmas.—Apparently very common: New Brunswick (introduced) and Maine (introduced) to Delaware, westward to Oregon, southward in the Mississippi Valley to Missouri, and southwest to Arizona. TYPE (in Herb. N. Y. State Col. Agric., Ithaca): dry ground, Cedar Point, Erie County, Ohio, July 17, 1914, L. H. MacDaniels, no. 106.

The *E. canadensis*, forma *crescendus* Ramaley, Bull. Geol. & Nat. Hist. Survey Minn. 9, p. 114 (1894) and the *E. crescendus* Wheeler, Minn. Bot. Stud. iii. 106 (1903) were probably based on material which is here included in the variety *vestitus*, but since they were based on size, not on pubescence of the lemmas, and since the name has not been used as a varietal name, it seems best not to take up one so inappropriate for our present variety. Certain specimens from Minnesota and the Dakotas have hairy leaves and sheaths, and may be the *E. canadensis* var. *vilosus* Bates, Amer. Botanist, xx. 17, (1914). In some of the specimens from the Northwest the glumes are unusually narrow.

CORNELL UNIVERSITY.

ROSA BLANDA AND ITS ALLIES OF NORTHERN MAINE AND ADJACENT CANADA.

M. L. FERNALD.

THE region of Silurian, Cambrian and Lower Carboniferous limestones and calcareous slates and sandstones extending from northern Maine to the St. Lawrence and across northern New Brunswick to the Gaspé Peninsula and Anticosti is strongly differentiated from the coastwise district of southern Maine, southeastern New Brunswick, and Nova Scotia, where the soils are chiefly derived from acid or at most only slightly calcareous rocks. Hundreds of species are known from the St. John Valley in Maine and New Brunswick and from Rimouski Co., Quebec, to Gaspé and Anticosti which are quite absent from the acid soils to the south and southeast; and almost every group of plants, when critically studied, furnishes striking cases of this differentiation.

In the genus *Rosa* this segregation along lithological lines is as pronounced as in other genera, with the result that in the acid or hardly calcareous coastwise region from southern New England to northeastern New Brunswick, the Magdalen Islands and southern Newfoundland *Rosa virginiana* L. and *R. carolina* L.¹ (*R. humilis* Marsh.) abound in the drier habitats and *R. nitida* Willd. in the bogs; while swamps and pond-shores northward to Megantic Co., Quebec, north-central Maine, and southwestern New Brunswick are often characterized by the abundance of *R. palustris* Marsh. (*R. carolina* Auth., see foot-note 1). In these four species of southern ~~acid~~ habitats the infrastipular prickles are normally present, the pedicels, hypanthiums and hips more or less bristly, and the achenes are borne at the base of the hip.

In the calcareous area to the north and northwest, however, from the St. John valley in Maine to Gaspé and Anticosti, these species are practically unknown (with the exception of rare colonies of *R. nitida* in sphagnum bogs and local colonies of *R. virginiana* in the Devonian sandstones about Gaspé Bay) and their places are taken by three species of quite different character; without infrastipular prickles, with glabrous pedicels, hypanthiums and hips, and with the achenes borne on the inner walls as well as at the base of the hips. These three northern calcicolous shrubs have all passed as *R. blanda* Ait., and since there is some question as to the exact identity of *R. blanda* it is necessary first to consider the original description of that species.

Rosa blanda Ait. Hort. Kew. ii. 202 (1789) was based upon two entirely different plants, which were very soon recognized by other botanists as belonging to quite distinct species. Aiton's treatment was as follows:

¹ *Rosa carolina* L. Sp. Pl. i. 492 (1753) was based solely on *Rosa Carolina fragrans, foliis mediolatis serratis* of Dillenius, Hort. Elth. 325, t. 245, fig. 316 (1732). The figure of Dillenius is beautifully definite and there can be no question that it clearly depicts the common 1-flowered glabrous-leaved *R. humilis* Marsh. with slender straight needle-like infrastipular prickles. Not merely the plate demonstrates this, but the description of the shrub as not exceeding a foot in height and having glabrous leaves is equally definite. The taller swamp species with strongly curved prickles, more corymbed flowers and usually pubescent finer-toothed leaves which has generally passed as *R. carolina* was taken up by Linnaeus as *R. carolina* in the 2d edition of the *Species Plantarum* (1762–63), and the significance of the name thus changed. This accounts for the subsequent very general treatment of the Swamp Rose as *R. carolina*. Dr. Rydberg informs me that the correct name of the Swamp Rose (*R. carolina* of Authors) is *R. palustris* Marsh. Arb. Am. 135 (1785). Marshall's description is characteristically vague but it apparently was intended to cover the *R. carolina* of Authors and the name *R. palustris* is certainly appropriate.

"*blanda*. 3. *R. germinibus globosis glabris, caulibus adultis pedunculisque laevibus inermibus.*

Hudson's Bay Rose.

Nat. of Newfoundland and Hudson's-bay.

Cult. 1773, by Mr. James Gordon.

Fl. May-August.

H. h.

DESCR. *Caules* adulti laeves, inermes; *juniores seu primi anni aculeis rectis subreflexis tenuibus armati. Rami* teretes, inermes, nitidi, rubicundi. *Folia pinnata: foliola* plerumque septem, oblonga, argute et subaequaliter serrata, glabra. *Petoli* glabri, plerumque una alterave spinula armati."

In view of the fact that no wild rose is yet known from Newfoundland with the pubescent foliage, connivent sepals (in fruit) and parietal achenes which are so characteristic of *R. blanda* as commonly interpreted (*R. Solandri* Tratt.¹), the writer supplied Dr. S. F. Blake when in London with a series of typical specimens of the various plants of eastern America which might have been involved in Aiton's *R. blanda*. From Dr. Blake's examination of the original specimens and their history it appears that Aiton had before him two entirely different roses: (1) a specimen from Hudson Bay, 1773, which, as stated in Dr. Blake's letter, "is true *R. blanda* as now generally understood, with tomentulose petioles, etc., and perfectly smooth calyx-tube"; and (2) a specimen collected by Banks from near St. John's, Newfoundland, a branch with over-ripe fruit bearing glandular bristles at the top but with the sepals fallen, which Dr. Blake writes "is certainly *R. virginiana* Miller (Crépin has written on it 'verus *R. lucida*')." Prior to Aiton's publication these two specimens had been written up, but not published, by Solander as different varieties of a manuscript *Rosa blanda*, the Newfoundland shrub as *R. blanda* α , the Hudson Bay shrub as *R. blanda* β . Examination of Solander's manuscript shows that in this, as in many other cases, the descriptions in *Hortus Kewensis* were derived with only minor changes from the Solander manuscript; but Aiton in the publication, which alone must be considered in settling the nomenclatorial type of *R. blanda*, took the Hudson Bay shrub as the primary portion of the species, making the Newfoundland shrub and the description of it supplementary. Thus the diagnosis "*R. germinibus globosis, caulibus adultis pedunculisque laevibus inermibus*" clearly describes the Hudson

¹ Tratt. Ros. Mon. ii. 150 (1823).

Bay shrub with its glabrous peduncles (or pedicels) and fruit and unarmed stem. In this diagnosis alone did Aiton describe the peduncles and fruit, the supplementary description containing no mention of them. This second description was taken almost without change from the Solander manuscript description of Banks's Newfoundland shrub (*R. virginiana* Mill.), which has glandular-bristly fruit and glabrous foliage, with the petioles frequently spinulose-armed.

It has generally been conceded that the Hudson Bay shrub with glabrous fruit and peduncles is the type of *R. blanda*, but recently some American publications have taken up *R. Solandri* Tratt., based upon the same Hudson Bay specimen as type, and have treated the Newfoundland specimen as the type of *R. blanda*. It should be clear, however, since Aiton's primary diagnosis, in which alone the fruit is described, applies definitely to the Hudson Bay plant, and since he called his species unequivocally the "Hudson's Bay Rose," that he had primarily in mind the Hudson Bay shrub, which he says was cultivated by Mr. James Gordon in 1773. The confusion with the "Hudson's Bay Rose" of material with over-ripe fruit from Newfoundland was natural; but, since the Newfoundland shrub described, without mention of its bristly fruit, in the last paragraph, proves to have been a somewhat uncharacteristic specimen of the earlier-published *R. virginiana*, a common species of southeastern Newfoundland, it would be a suppression of Aiton's obvious intent to urge that, because in the third paragraph "Newfoundland" precedes "Hudson's-bay," Aiton's *R. blanda*, the "Hudson's Bay Rose," with glabrous fruits must be made to rest upon the Newfoundland specimen with bristly fruit as type.

The specific name *blanda*, too, is highly appropriate for a species with smooth fruits, smooth peduncles and unarmed petioles and flowering branches, but it would be peculiarly inappropriate for a shrub with bristly fruits and peduncles, spinulose petioles and rachises, and young stems, as Aiton described the Newfoundland shrub, "aculeis rectis subreflexis tenuibus armati." Although it is possible to argue: "What's in a name? That which we call *Rosa blanda* by the name *Rosa Solandri* would be more clear," it seems sufficiently obvious that Aiton meant by the "Hudson's Bay Rose" the rose which he diagnosed from Hudson Bay and that the name *Rosa blanda* is correctly retained for that species.

Rosa blanda has the sepals persistent and becoming strongly con-

nivent in fruit, forming a beak-like summit to the hips, a character shared with *R. acicularis* Lindl. and other species which occur west of our area. *R. blanda* is a common rose of the river-thickets from northern Maine to the St. Lawrence and Anticosti, but associated with it on the gravels of the St. John River and its tributaries in Maine and New Brunswick is another shrub which, like *R. blanda*, is without infrastipular prickles on the flowering stems and also has glabrous hypanthium and fruit and parietal achenes but the leaves as glabrous as in *R. virginiana* and the sepals as reflexed in mature fruit as in the latter species. In other words, this shrub, which abounds on the calcareous gravels of the St. John River, shares many traits of *R. blanda* and others of *R. virginiana*, yet is thoroughly distinct from either. That it is not a hybrid occurring along the borders of the ranges of *R. blanda* and *R. virginiana* is apparent from the fact that it occurs entirely outside the range of the latter species. So characteristic is this shrub of the St. John Valley that it may appropriately be called

Rosa johannensis, n. sp., caulis 0.3–1 m. altis, adultis inermibus vel imis setosis rufescensibus, junioribus plus minusve setosis vel rare aculeatis, aculeis rectis basi dilatis; ramulis inermibus glabris lucidis plerumque purpurascensibus; stipulis dilatatis adnatis 1.5–3 cm. longis glabris ciliatis plus minusve glanduloso-dentatis, laminis liberis lanceolato-ovatis; petiolis rhachibusque glabris vel sparsissime pilosis glabratisque inermibus; foliolis 5–9 plerumque 7 ovalibus vel anguste obovatis argute serratis supra sublucidis subtus pallidis glabris vel subtus ad venas sparse pilosis 1.5–5.5 cm. longis; floribus solitariis vel corymbosis; pedicellis 1–3 cm. longis glabris; hypanthio glabro subgloboso supra non attenuato basi rotundato in anthesi 5–9 cm. diametro; fructibus oblato-globosis aurantiaco-rubris 1–1.5 cm. diametro; sepalis plus minusve glandulosis lanceolato-ovatis caudato-appendiculatis sub anthesin divergentibus vel reflexis persistentibus, laminis 0.9–1.4 cm. longis appendiculo 1.2–2 cm. longo; petalis roseo-purpureis 2.5–3.5 cm. longis; stylis distinctis persistentibus non exsertis; achaeniis basilaribus parietalibusque.

Stems 0.3–1 m. high; the adult unarmed or at base setose, reddish; the young more or less setose or rarely prickly, with straight broad-based prickles; branchlets unarmed, glabrous, shining, usually purplish: stipules dilated, adnate, 1.5–3 cm. long, glabrous except at the ciliate margin, more or less glandular-dentate; the free blades lanceolate: petioles and rhachis glabrous or very sparsely pilose and becoming glabrate, unarmed: leaflets 5–9, usually 7, oval or narrowly obovate, coarsely serrate, somewhat shining above, pale beneath, glabrous or sparsely pilose on the nerves beneath, 1.5–5.5 cm. long:

flowers solitary or corymbed: pedicels 1–3 cm. long, glabrous: hypanthium glabrous, subglobose, not attenuate above, rounded at base, in anthesis 5–9 mm. in diameter: fruit oblate-globose, orange-red, 1–1.5 cm. in diameter: sepals more or less glandular, lance-ovate, caudate-appendiculate, after anthesis divergent or reflexed, persistent; the blades 0.9–1.4 cm. long; the appendage 1.2–4 cm. long; petals rose-purple, 2.5–3.5 cm. long: styles distinct, persistent, not exserted: achenes borne at the base and on the walls of the hypanthium.—Valley of the St. John River and tributaries, New Brunswick and Maine. NEW BRUNSWICK: river-gravels and shingly border of thicket by the St. John River, Woodstock, July 14, 1916, *Fernald & Long*, no. 13,925. MAINE: wet gravelly banks of the St. John between the Great Black and Little Black Rivers, July 27, 1917, *Harold St. John*; St. Francis, 1881, *Kate Furbish*; gravelly shores, Fort Kent, 1881, *Kate Furbish*, September 21, 1899, *Fernald*; Winding Ledges, Fort Kent, July 23, 1900, *E. F. Williams*; gravelly shore of the St. John, Van Buren, September 11, 1899, *Fernald* (TYPE in Gray Herb.); gravel-beach of Aroostook River, Fort Fairfield, August 10, 1909, *Fernald*, no. 1949.

Forma **albina**, n. f., petalis albis.—With the typical form, Woodstock, NEW BRUNSWICK, July 14, 1916, *Fernald & Long*, no. 13,926 (TYPE in Gray Herb.).

Distinguished from *R. blanda*, with which it hybridizes, by its glabrous darker-green leaves and the widely divergent or reflexed mature sepals; from *R. virginiana* by the lack of infrastipular prickles, the glabrous pedicels and hypanthiums, and parietal as well as basal achenes.

The other rose is a more northern shrub of calcareous ledges and thus far known only from Bic in Rimouski Co., Quebec. It is a great pleasure to associate with this species the name of one of the writer's companions in collecting the type-material and for years his companion on many memorable botanical explorations of northern Maine and eastern Quebec, Emile Francis Williams. This species is, therefore, called

Rosa Williamsii, n. sp., caulibus 3–5 dm. altis, adultis inermibus vel sparse setosis purpurascens; ramulis inermibus glabris; stipulis dilatatis adnatis 1–2 cm. longis subtus glanduloso-pulverulentis valde glanduloso-ciliatis, laminis liberis semiovatis; petiolis rhachibusque glanduloso-pulverulentis -setulosisque; foliolis 5–7 plerumque 7 cuneato-obovatis apice plerumque rotundatis vel subtruncatis supra medium argute simpliciter vel dupliciter serratis utrinque breviter pilosis subtus in nervis glandulosis 1–3.5 cm. longis; floribus solitariis vel binis; pedicellis 1–1.5 cm. longis glabris; hypanthio glabro ovoideo in anthesin 3.5–4.5 mm. diametro; fructibus pyri-

formibus basi attenuatis succulentis 1.1–1.3 cm. longis 7–8 mm. crassis; sepalis lanceolato-ovatis dorso laevibus vel pilosis plus minusve glanduloso-ciliatis sub anthesin arcte reflexis persistentibus, laminis 5–7 mm. longis, appendiculo foliaceo glanduloso-ciliato 4–8 mm. longo; petalis roseis 1.7–2 cm. longis; stylis distinctis persistentibus nec exsertis; achaeniis basilaribus parietalibusque.

Stems 3–5 dm. high; the adult unarmed or sparsely setose, purplish: branchlets unarmed, glabrous: stipules dilated, adnate, 1–2 cm. long, glandular-pulverulent beneath, conspicuously glandular-ciliate; the free blades semi-ovate: petiole and rhachis glandular-pulverulent and -setulose: leaflets 5–7, mostly 7, cuneate-obovate, chiefly rounded or subtruncate at summit, coarsely and simply or doubly serrate above the middle, short-pilose on both surfaces, glandular on the nerves beneath, 1–3.5 cm. long: flowers solitary or paired: pedicels 1–1.5 cm. long, glabrous: hypanthium glabrous, ovoid, in anthesis 3.5–4.5 mm. in diameter; in fruit becoming pyriform with attenuate base, succulent, 1.1–1.3 cm. long, 7–8 mm. thick: sepals lance-ovate, smooth or pilose on the back, more or less glandular-ciliate, after anthesis tightly reflexed and persistent; the blades 5–7 mm. long; the foliaceous glandular-ciliate appendage 4–8 mm. long: petals roseate, 1.7–2 cm. long: styles distinct, persistent, not exserted: achenes borne at the base and on the walls of the hypanthium.—
QUEBEC: abundant on dry calcareous ledges, Cap Enragé, Bic, Rimouski Co., July 8, 1905, Williams, Collins & Fernald (TYPE in Gray Herb.).

A very distinct shrub, differing from *R. blanda* Ait. and *R. acicularis* Lindl. in the tightly reflexed very short sepals and very small hypanthium and fruit; from *R. virginiana* in the small smooth sepals and smooth fruits, the parietal achenes, pubescent foliage, etc., and from *R. johannensis*, described above, in the much smaller flowers and small pyriform fruit, very glandular stipules, petiole and rhachis and pubescent more cuneate leaflets. At the type locality *R. Williamsii* occurred on dry calcareous ledges with *Woodsia oregana* D. C. Eaton, *Draba stylaris* J. Gay, *Arabis Collinsii* Fernald and other calcicolous xerophytes.

GRAY HERBARIUM.

SOME CONNECTICUT PLANTS.

R. W. WOODWARD.

Panicum oricola. Old Lyme, frequent on banks of tidal streams and along the shores of Long Island Sound. Orange, abundant on a salt marsh coated with sand. Specimens from these stations have been verified by Mrs. Agnes Chase.

Agrostis alba aristata. Old Lyme, frequent in rocky pastures.

Alopecurus geniculatus aristulatus. Franklin, abundant in a swampy depression in glacial gravel.

Puccinellia paupercula alaskana. This plant, reported from the Blackhall river, Old Lyme by Dr. C. B. Graves, occurs in the same town along the shore of Long Island Sound. At the latter station, on some of the plants, a few of the spikelets have noticeably longer glumes and lemmas, with the second glume 5-nerved and the lemma 7-nerved, which suggests a tendency to approach the var. *longiglumis* of Fernald and Weatherby.

Juncus dichotomus. Old Lyme, shore of Long Island Sound.

Luzula campestris bulbosa. Old Lyme, in hard dry soil. This station is of interest, as being north of the ordinary range of this variety, and also because the plants exhibit little of the caespitose character commonly associated with varieties of *Luzula campestris*. Of the hundred or more plants seen by the writer, the majority had only a single culm. The var. *multiflora*, growing on the edges of the station, was strongly caespitose, and showed no tendency to develop bulblets.

Spergularia canadensis. Old Lyme, fairly common along Blackhall river and on muddy shores near Long Island Sound. It occurs in colonies, and also associated with *S. leiosperma*. Groton is the only station reported in the Connecticut Catalogue.

Parnassia caroliniana. In eastern Connecticut, an essentially non-calcareous region, this species, which is commonly classed among the lime plants, is abundant in many places, as, for instance, at Franklin, where it is a common fall flower on wet meadows.

Lechea Leggettii. Plentiful about Wintergreen Lake, New Haven. The writer collected the plant at this station in 1903, and has seen it there many times since.

Convolvulus spithameus. The writer collected this species on a low gravel ridge in Franklin, in June, 1908, and has observed it growing at the same station nearly every year since that date. This appears to be the only station reported from Eastern Connecticut.

Pedicularis lanceolata. Franklin, frequent by streams and on low grounds.

Bidens Eatoni. Old Lyme, in brackish marshes, where it grows among tall grasses and sedges, and is not easy to detect till late in the season. The writer's first collection was made September 29, 1915. Professor M. L. Fernald states that the Lyme plant is "perfectly good *Bidens Eatoni*; exactly like the plant from the Merrimac marshes."

Helenium nudiflorum. A colony of several hundred plants in a remote pasture, at Old Lyme.

Lapsana communis. Well established in Franklin, where the writer has collected it for several years. New Haven is the only station reported in the Connecticut Catalogue.

Sonchus arvensis. Old Lyme, on gravelly shores.

Specimens of the above plants, with three exceptions, have been deposited in the Gray Herbarium, and the remaining plants will be deposited later.

NEW HAVEN, CONNECTICUT.

NOTE ON THE PROPER NAME FOR THE SASSAFRAS.—The scientific name of the common Sassafras, which has suffered at least two alterations within the past four decades, must once more be changed, although the name to be adopted is fortunately that by which the species has been most universally known. The plant was originally described by Linnaeus as *Laurus Sassafras* (Sp. i. 371 (1753)). Salisbury, in pursuance of that policy of "improving" scientific names to which he seems to have given freer rein than almost any other of the early botanists, based the new name *Laurus variifolia* (Prod. 344 (1796)) on *Laurus Sassafras* L. Sp. ed. 2. 530, without a word of description or annotation. His name is consequently a perfect example of the class of still-born names (*nomina abortiva*), which according to the International Rules of Nomenclature, as finally drawn up in 1910, are incapable of adoption unless employed by the first author who transferred the plant to its accepted position. The name *Sassafras*

variifolium (Salisb.) Ktze. Rev. i. 574 (1891), now used by those who follow the Vienna Rules and reject the tautonym *Sassafras Sassafras* (L.) Karst. Deutsch. Fl. 505 (1880–83), must accordingly be dropped. The valid name to replace it is **SASSAFRAS OFFICINALE** Nees & Eberm. Handb. Med.-Pharm. Bot. ii. 418 (1831), a name given when the species was transferred from *Laurus* to *Sassafras*. It should be mentioned, in explanation of the use of *S. variifolium* (Salisb.) Ktze. in the seventh edition of Gray's Manual (1908), that at the time the Manual was prepared the status of the class of names known as *nomina abortiva* was still under discussion and no legislation regarding them had been incorporated in the International Code.

The subglabrous and more or less glaucous variety, recently discussed by Prof. Fernald in *RHODORA*, should be called

SASSAFRAS OFFICINALE Nees & Eberm. var. **albidum** (Nutt.) comb. nov.—*Laurus (Euosmus) albida* Nutt. Gen. i. 259 (1818). *Sassafras variifolium* (Salisb.) Ktze. var. *albidum* (Nutt.) Fernald, *RHODORA* xv. 16 (1913), q. v. for full synonymy.

Mention should be made of an earlier and (by International Rules) untenable use of the name *Sassafras officinalis* by Siebold in 1830. It occurs in his synopsis of the economic plants of Japan (Verh. Batav. Genootsch. xii. 23 (1830)), as follows.

“Sassafras, Sieb.

“*S. officinalis*, Sieb. *Siromotsi*, Japon. (v. v. h. b.).

“*Sijnon*: *Laurus Sassafras* P. S. . . .

“*S. Thunbergii*, Sieb. *Kuromotsi*, Japon. (v. v. h. b.).

“*Sijnon*: *Lindera umbellata*, Th. . . .”

As Siebold's use of the name *Sassafras*, although apparently the earliest in postlinnaean times, is unaccompanied by diagnosis or reference to an earlier generic name, it is not valid according to the International Rules. His name *S. officinalis*, although based on *Laurus Sassafras* P(ers.) S(y)n. i. 450 (1805)), must consequently be disregarded. The plant really intended by Siebold is of course not our Sassafras, which does not grow in Japan, but is, according to the Index Kewensis, *Lindera triloba* Blume, while his *S. Thunbergii* is *Lindera umbellata* Thunb.—S. F. BLAKE, Gray Herbarium.

A NEW BOTANICAL TEXTBOOK FOR HIGH SCHOOLS.—Botany now occupies at least in the secondary schools of New England and New York, a rather precarious place in the course of study. Reaction against the formal morphology and systematic botany of the older texts, and the excessive experimentation required by more recent authors, has in many schools crowded botany as such out of the course, and it occupies with zoölogy and physiology, a scant third of the freshman or sophomore year of "biology." A book like Allen and Gilbert's new text¹ ought to revive interest in the science as a matter of practical everyday education for everyone, especially in rural, village and suburban schools.

Simple and for the most part familiar types are studied for thirteen chapters, outlining the great divisions of plant life. The cucumber with its monoecious flowers comes first, thus giving the idea of sex and fertilization clearly at the start. These chapters are not so elaborate nor so scientific as those which correspond in Atkinson's Botany for High Schools, but they are much better adapted for young students.

Five chapters are given to the morphology and uses of roots, stems, leaves, flowers and fruits. The remaining six chapters deal largely with economic botany, including forestry, plant breeding and plant-diseases. Laboratory and field work is carefully planned for each chapter, but it is printed at the end of the book where it does not interfere with the obvious readability of the text.

Instead of giving a mutilated key to the flora, with a small number of species listed and no ranges given, the authors urge the students to use the accepted manuals for various parts of the country.

Much is said incidentally in regard to plant relations to environment, but the book would be considerably stronger if these facts were summed up in a good chapter on ecology, even at the expense of condensation in the economic chapters.

The authors have with clearness and ease given the latest scientific conclusions about plant life and growth. They have been successful in keeping down the number of technical terms to a minimum. The book is worthy of the attention of the general reader, as well as of the High School student and teacher.—CLARENCE H. KNOWLTON.

¹ TEXTBOOK OF BOTANY. By Charles E. Allen and Edward M. Gilbert. pp. 450 + x, illustrated. Cloth, \$1.48. D. C. Heath & Co., Boston.

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